

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25997

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12N 15/82, 15/87; A01H 1/00
US CL : 536/23.1, 23.6; 800/278, 298; 435/468, 419, 320.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 536/23.1, 23.6; 800/278, 298; 435/468, 419, 320.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST, STN: agricola, biosis, caba, capplus; sequence search of DNA encoding SEQ ID NO:3 and search of SEQ ID NO:2

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | NCBI database for nucleotide sequences, National Center for Biotechnology Information, National Library of Medicine, NIH (Bethesda, MD, USA) WHITELAW, C. Accession Number CC631538, June 2003. encodes a protein 76% identical to SEQ ID NO:3. | 1 |
| A | US 6,696,623 B1 (DOERNER et al) 24 FEBRUARY 2004 (24.02.2004), entire document. | 1-3, 5-8, 11, 18 |

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|--------------------------|---|--------------------------|--|
| <input type="checkbox"/> | Further documents are listed in the continuation of Box C. | <input type="checkbox"/> | See patent family annex. |
| * | Special categories of cited documents: | "T" | later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention |
| "A" | document defining the general state of the art which is not considered to be of particular relevance | "X" | document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone |
| "E" | earlier application or patent published on or after the international filing date | "Y" | document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "L" | document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "&" | document member of the same patent family |
| "O" | document referring to an oral disclosure, use, exhibition or other means | | |
| "P" | document published prior to the international filing date but later than the priority date claimed | | |

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| Date of the actual completion of the international search 15 November 2004 (15.11.2004) | Date of mailing of the international search report 03 JAN 2005 |
| Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230 | Authorized officer  Stuart F. Baum Telephone No. 703-308-0196 |

INTERNATIONAL SEARCH REPORT

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Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Continuation Sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-3, 5-8, 11 and 18 including DNA encoding SEQ ID NO:3 and SEQ ID NO:2

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:3, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group II, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:5, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group III, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:7, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group IV, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:10, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group V, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:12, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group VI, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:14, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group VII, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:17, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group VIII, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:19, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group IX, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:21, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group X, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:24, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

INTERNATIONAL SEARCH REPORT

Group XI, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:26, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XII, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:28, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XIII, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:31, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XIV, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:34, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XV, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:36, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XVI, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:38, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XVII, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:41, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XVIII, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:43, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XIX, claim(s) 1-3, 5-8, 11 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:45, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XX, claim(s) 1-8, 11, 16 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:48, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Group XXI, claim(s) 1-8, 11, 16 and 18, drawn to an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:49, a vector comprising said nucleic acid molecule and host cell transformed therewith, a method of introducing an isolated nucleic acid into a host cell, and plant, plant cell, plant material or seed comprising said isolated nucleic acid molecule.

Groups XXII-XLII, claim(s) 10, drawn to an isolated polypeptide comprising an amino acid sequence according to the sequences listed in claim 10. Group XXII comprises SEQ ID NO:3, Group XXIII comprises SEQ ID NO:5, Group XXIV comprises SEQ ID NO:7, etc.

INTERNATIONAL SEARCH REPORT

Group XLIII-LXIII, claim(s) 17, drawn to a method for detecting a nucleic acid in a sample comprising an isolated nucleic acid molecule encoding a protein. Group XLIII comprises a nucleic acid molecule encoding SEQ ID NO:3, Group XLIV comprises a nucleic acid molecule encoding SEQ ID NO:5, Group XLV comprises a nucleic acid molecule encoding SEQ ID NO:7, etc.

If Applicant elects any of Groups I-XXI or XLIII-LXIII, Applicant is also to elect a DNA sequence from claim 2 that encodes the elected amino acid sequence.

The inventions listed as Groups I-XLIII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Pursuant to 37 CFR 1.475(d), the ISA/US considers that where multiple products and processes are claimed, the main invention shall consist of the first invention of the category first mentioned in the claims and the first recited invention of each of the other categories related thereto. Accordingly, the main invention (Group I) comprises the first recited product, an isolated nucleic acid molecule comprising a nucleic acid which encodes an amino acid sequence of SEQ ID NO:3. Further pursuant to 37 CFR 1.475(d), the ISA/US considers that any feature which the subsequently recited products and methods share with the main invention does not constitute a special technical feature within the meaning of PCT Rule 13.2 and that each of such products and methods accordingly defines a separate invention.

Applicants' chemical compounds, i.e., different DNA sequences encoding different polypeptides, each have different properties and different core structures that elicit different activities; and as such, each of the Groups I-XXI, Groups XX-XLII and Groups XLIII-LXIII are not linked by, or share, a single special technical feature.

Methods of increasing the size of a plant comprising transforming a plant with a heterologous nucleic acid molecule are known in the art. Doerner et al (December 2000, U.S. Patent 6,166,293) teach transforming a plant with a nucleic acid molecule which increases the size of the transformed plant compared to a non-transformed plant.

In addition, the claims are not linked by a single special technical feature because they are each drawn to products and processes not required by the other. The isolated nucleic acid encoding the polypeptide of SEQ ID NO:3, is not required by each of the Groups II-XXI, which is not required by the isolated polypeptides of Groups XXII-XLII, or which is not required by the method for detecting a nucleic acid in a sample of Groups XLIII-LXIII.

Claims 9, 12-15 and 19-20 are unsearchable because they are improper multiple dependent claims.